

Potential benefits of delta encoding and data compression for HTTP (1997) (Make

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Jeffrey C. Mogul, et al.

SIGCOMM

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**Abstract:** ing with credit is permitted. To copy otherwise, to republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee. Abstract Caching in the World Wide Web currently follows a naive model, which assumes that resources are referenced many times between changes. The model also provides no way to update a cache entry if a resource does change, except by transferring the resource's entire new value. Several previous papers have proposed updating cache... [\(Update\)](#)

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.... [25] measures gains involved in piggybacking invalidates along with reply messages in order to lower the number of IMS requests, and [30] investigates delta encoding as a means of update propagation, only [13] proposes a technique for deciding the basis for propagating...

...of cache consistency or content distribution. For instance, piggybacking of invalidations [15] the use of deltas for sending updates [17], an application level multicast framework for internet distribution [9] the efficacy of sending updates versus invalidates [8] and...

Cited by: [More](#)

Dynamic Suppression of Similarity in the Web: a Case for . . . - Douglass, Iyengar (2002) [\(Correct\)](#)

Workload Characterization of a Personalized Web Site .. - Shi, Wright.. (2002) [\(Correct\)](#)

Scalable Consistency Maintenance in Content.. - Ninan, Kulkarni.. [\(Correct\)](#)

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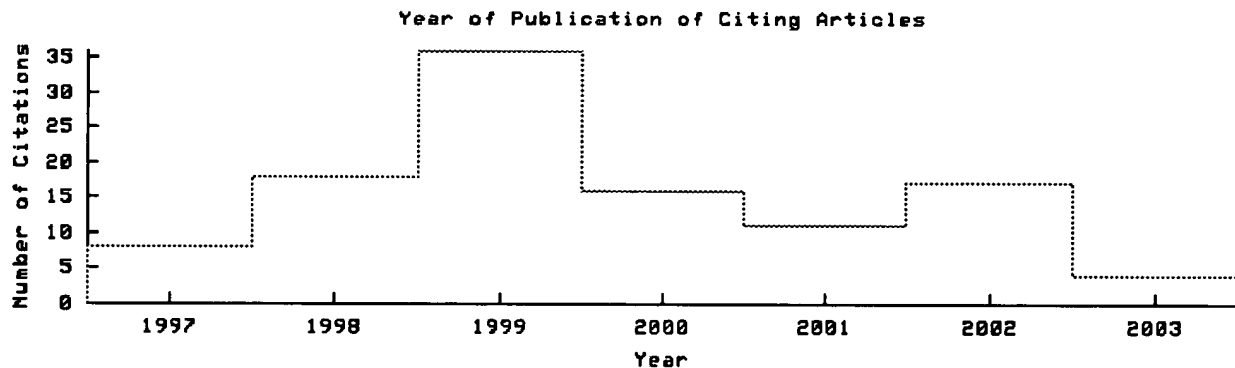
J. C. Mogul, F. Douglass, A. Feldmann, and B. Krishnamurthy. Potential benefits of delta encoding and data compression for HTTP. In Proceedings of the ACM SIGCOMM '97 Symposium, Cannes, France, Sept. 1997.

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```
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  author = "Jeffrey C. Mogul and Fred Dougkis and Anja Feldmann and Balachander K
  title = "Potential Benefits of Delta Encoding and Data Compression for {HTTP}",
  booktitle = "{SIGCOMM}",
  pages = "181-194",
  year = "1997",
  url = "citeseer.nj.nec.com/article/mogul97potential.html" }
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**Citations (may not include all citations):**

- 219 Web Server Workload Characterization: The Search for Invaria.. - Arlitt, Williamson - 1996
- 168 Removal Policies in Network Caches for World-Wide Web Docume.. - Williams, Abrams et al. - 1996
- 136 Potential benefits of delta encoding and data compression fo.. - Mogul, Dougkis et al. - 1997
- 133 Rate of Change and Other Metrics: A Live Study of the World .. - Dougkis, Feldmann et al. - 1997
- 113 RCS - A System For Version Control - Tichy - 1985
- 57 Optimistic Deltas for WWW Latency Reduction - Banga, Dougkis et al. - 1997
- 52 IP Headers for LowSpeed Serial Links (context) - Jacobson - 1990
- 44 WebExpress: A System for Optimizing Web Browsing in a Wirele.. (context) - Housel, Lindquist - 1996
- 44 Data Compression - Lelewer, Hirschberg - 1987
- 33 Adapting to Network and Client Variation via On-Demand Dynam.. (context) - Fox, Gribble et al. - 1996
- 18 Network Performance Effects of HTTP (context) - Nielsen, Gettys et al. - 1997
- 16 An Empirical Study of Delta Algorithms - Hunt, Vo et al. - 1996
- 11 Personal communication (context) - Williams - 1996
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**Documents on the same site (<http://www.research.att.com/~dougkis/vita.html>):** [More](#)

Adaptive Modern Connection Lifetimes - Dougkis, Killian (1999) [\(Correct\)](#)

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[Optimizing ML with Run-Time Code Generation - Leone, Lee \(1995\) \(Correct\) \(91 citations\)](#)

We describe the design and implementation of a **compiler** that automatically translates ordinary programs

Optimizing ML with Run-Time **Code** Generation Mark Leone Peter Lee December 1995

[foxnet.cs.cmu.edu/~petel/papers/staged/mleone-pidi96.ps](http://foxnet.cs.cmu.edu/~petel/papers/staged/mleone-pidi96.ps)

[Coded Modulation for Differential Encoding and... - Fischer, Lampe... \(2000\) \(Correct\)](#)

**C**oded Modulation for **Differential Encoding** and

**C**oded Modulation for **Differential Encoding** and Non-Coherent Reception on Fading

[www.LNT.de/LNT2/papers/ltg00\\_mlc.ps.gz](http://www.LNT.de/LNT2/papers/ltg00_mlc.ps.gz)

[Foreign Event Handlers to Maintain Information Consistency and... - Queloz \(1999\) \(Correct\)](#)

paper is to describe novel applications of Mobile **Code** technology which have not appeared yet but should

by Mobile **C**ode still have to agree on high level **encoding** and synchronization primitives but these

[cuiwww.unige.ch/~queloz/papers/mac3.1999.ps.gz](http://cuiwww.unige.ch/~queloz/papers/mac3.1999.ps.gz)

[Differential Encoding Strategies for Transmission... - Fischer, Lampe... \(2000\) \(Correct\)](#)

Keywords Fading channels, **differential encoding**, **coded** modulation, multilevel **codes**, channel capacity 1.

Submitted to AE Int. J. Electr. Commun. 1 **Differential Encoding** Strategies for Transmission over

[www-nt.e-technik.uni-erlangen.de/~dcg/papers/aeu\\_00.ps.gz](http://www-nt.e-technik.uni-erlangen.de/~dcg/papers/aeu_00.ps.gz)

[Adaptive Chain Coding for Arbitrary Curves - Chang Kulkarni \(Correct\)](#)

using the 8-connected chain **code** to further **compress** the data 5 See 6 7 8 for other

(b) 8-connected templates technique. Standard chain **codes** use straight line segments of predetermined multiple templates is developed. The algorithm **differentially encodes** a curve using a directional template.

[www-video.eecs.berkeley.edu/~nlachang/Research/spie92.ps.gz](http://www-video.eecs.berkeley.edu/~nlachang/Research/spie92.ps.gz)

[Massively Parallel Computing: Mathematics and communications... - Johnsson, Mathur \(1993\) \(Correct\)](#)

heavily upon the availability of libraries until **compilation** and run-time system technology is

59]In mature architectures, **compiler** generated **code** with supporting run-time systems achieves an

complete aircraft. Solution techniques based on **differential** equations lead to sparse systems of equations,

[ftp.das.harvard.edu/techreports/tr-01-93.ps.gz](http://ftp.das.harvard.edu/techreports/tr-01-93.ps.gz)

[Iterative Joint Design of Fixed-Rate Source Codes and... - Goldsmith, Effros \(1997\) \(Correct\)](#)

While variable-rate source **codes** achieve better **compression** for a given distortion and source vector

Iterative Joint Design of Fixed-Rate Source **Codes** and Multiresolution Channel **Codes** Andrea

[www.cco.caltech.edu/~rjm/effros/papers/ct97.ps.Z](http://www.cco.caltech.edu/~rjm/effros/papers/ct97.ps.Z)

[DEFLATE Compressed Data Format Specification version 1.3 - Deutsch \(1996\) \(Correct\) \(4 citations\)](#)

Category: Informational May 1996 DEFLATE **Compressed** Data Format Specification version 1.3 Status of

[ftp.kiae.su/pub/1/internet/rfc/rfc1951.ps](http://ftp.kiae.su/pub/1/internet/rfc/rfc1951.ps)

[TIL: A Type-Directed Optimizing Compiler for ML - Tarditi, Morrisett, Cheng \(1995\) \(Correct\) \(116 citations\)](#)

TIL: A Type-Directed Optimizing **Compiler** for ML David Tarditi Greg Morrisett Perry

[www.cs.cmu.edu/~rwh/papers/tit/tr.ps](http://www.cs.cmu.edu/~rwh/papers/tit/tr.ps)

[Typed Closure Conversion for Recursively-Defined Functions... - Morrisett, Harper \(1998\) \(Correct\) \(2 citations\)](#)

[2]and was used until recently in the SML/NJ **c** **mpiler** [3]Closure-passing does have its drawbacks:

a data structure consisting of a pointer to closed **code** and another data structure which represents the

here have a direct correspondence to type **encodings** used for various kinds of object-oriented

[cs.cornell.edu/home/jgm/papers/hootsclosure.ps](http://cs.cornell.edu/home/jgm/papers/hootsclosure.ps)

[The Jalapeño Dynamic Optimizing Compiler for Java - Burke, Choi, Fink... \(1999\) \(Correct\) \(24 citations\)](#)

20.23 11.58 1.75 0.98 Array 4.95 10.15 1.01 0.84 **C** **mpress** 85.67 46.08 5.86 7.23 DB 7.18 3.89 1.73 2.94

The Jalape~no Dynamic Optimizing **Compiler** for Java TM Michael G. Burke Jong-Deok Choi

[www.mcs.newpaltz.edu/~hind/papers/grandes.ps](http://www.mcs.newpaltz.edu/~hind/papers/grandes.ps)

An Integrated Compilation and Performance Analysis Environment for ... - Adve (1995) (Correct) (30 citations)  
Overview pane at the top of the window shows a "**compressed**" view of the Erlebacher source **code**, with only  
An Integrated **C mpilation** and Performance Analysis Environment for  
[vibes.cs.uiuc.edu/Publications/Papers/HPF.ps.gz](http://vibes.cs.uiuc.edu/Publications/Papers/HPF.ps.gz)

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Differential Geometry And Applications Proc. Conf.Aug.  
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PSK demodulator for LEO satellite direct sequence/**code** division multiple access (DS/CDMA) communications  
VOL. 46, NO. 11, NOVEMBER 1998 2967 Generalized Differential Encoding: A Nonlinear Signal Processing  
11, NOVEMBER 1998 2967 Generalized Differential Encoding: A Nonlinear Signal Processing Perspective  
[spincom.ece.umn.edu/download/sp98gini.pdf](http://spincom.ece.umn.edu/download/sp98gini.pdf)

Performance of Coded Modulation employing... - Fischer... (Correct)

Performance of **Coded** Modulation employing **Differential Encoding** over  
Performance of **Coded** Modulation employing **Differential Encoding** over Rayleigh Fading Channels Robert  
of **Coded** Modulation employing **Differential Encoding** over Rayleigh Fading Channels Robert F.H.  
[www-nt.e-technik.uni-erlangen.de/~dcg/papers/elet3.ps.gz](http://www-nt.e-technik.uni-erlangen.de/~dcg/papers/elet3.ps.gz)

Evaluating Runtime-Compiled Value-Specific Optimizations - Keppel, Eggers, Henry (1993) (Correct) (24 citations)

directly [Kes90]Data Decompression The **compression** algorithm is optimized for fast decompression  
Evaluating Runtime-**Compiled** Value-Specific Optimizations 1 Evaluating  
[ftp.cs.washington.edu/tr/1993/11/UW-CSE-93-11-02.PS.Z](http://ftp.cs.washington.edu/tr/1993/11/UW-CSE-93-11-02.PS.Z)

Of What Use is a Verified Compiler Specification? - Curzon (1992) (Correct) (1 citation)

Of What Use is a Verified **Compiler** Specification? Paul Curzon Technical Report  
[www.cl.cam.ac.uk/ftp/hvg/papers/WhyCompilerSpec.ps.gz](http://www.cl.cam.ac.uk/ftp/hvg/papers/WhyCompilerSpec.ps.gz)

Compiling Standard ML to Java Bytecodes - Benton, Kennedy, Russell (1998) (Correct) (27 citations)

**C mpiling** Standard ML to Java Bytecodes Nick Benton,  
[www.cl.cam.ac.uk/users/pnb/icfp98.ps.gz](http://www.cl.cam.ac.uk/users/pnb/icfp98.ps.gz)

Performance Comparison Of Video Transport Over ATM... - Hossain, Kang, Horst (Correct)

can transmit, receive, decompress and display **compressed** video over various networks. Our video  
[berserk.vlsi.uiuc.edu/people/ashfaq/ieee.mm97.ps](http://berserk.vlsi.uiuc.edu/people/ashfaq/ieee.mm97.ps)

Programming Language Support for Digitized Images or, The... - Stevenson, Fleck (Correct) (2 citations)

scanners (e.g. MRI)Although they can be **compressed** when stored in files, images must remain  
operations that loop through images must be **compiled** from (a specialized subset of) Scheme into C.  
research results. This paper shows how user-level **code** can be simplified by providing better programming  
[www.cs.hmc.edu/~fleck/envision/scheme48/top-dir/compiler/top-dir/patches/top-dir/digitized-images.ps](http://www.cs.hmc.edu/~fleck/envision/scheme48/top-dir/compiler/top-dir/patches/top-dir/digitized-images.ps)

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